

An Automated and Robust Tertiary Institution Web-Based Student Complaint Management System

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Abstract - The primary aim of this study is to devise and implement an automated and robust Web-based Student Complaint Management System tailored for tertiary institutions. It is evident that numerous students encounter formidable challenges within higher education institutions, primarily stemming from the difficulty associated with registering complaints. Moreover, even when registration is possible, the response to complaints tends to be notably sluggish. In addressing these issues, our focus has been on constructing a system that streamlines the complaint submission process for students, while concurrently ensuring meticulous tracking of all registered complaints.

The adoption of the Waterfall Methodology guided our research methodology. In the system design phase, I meticulously modeled the data flow to encapsulate the procedural intricacies of the system. The development of the system employed an array of sophisticated tools, including the PHP programming language, JavaScript, Hyper Text Markup Language (HTML), Cascading Style Sheet (CSS), and MySQL. The MySQL server application functioned as the Database Management System (DBMS), while the Visual Studio Code application served as the Integrated Development Environment (IDE).

The pinnacle achievement of this research endeavor is highly effective and efficient automated and robust web-based student complaint management software. Not only does it successfully fulfill the project objectives, but it also prioritizes user-friendliness, ensuring a seamless experience for all stakeholders involved.

Keywords: Integrated Development Environment, Cascading Style Sheet, Student Complaint Management System, Waterfall Methodology, Hyper Text Markup Language.

1. Introduction

According to Anusiuba, et.al, (2023). In an attempt to fortify the foundations of an effective educational system, meticulous attention must be directed towards resolving issues within the academic environment. One critical concern is the management of academic complaints in university settings, a fact that has historically impeded academic growth across

various dimensions of the educational spectrum. To address this, the present project discerns a spectrum of options for managing and resolving academic complaints, emphasizing the proactive resolution of potential issues at an informal level in the initial stages. The comprehensive approach to handling complaints involves active listening, understanding, proposing solutions, executing remedies, and subsequent follow-ups.

In accordance with the Collins English Dictionary, a complaint is an expression of dissatisfaction with a particular situation. Numerous students, particularly newcomers, grapple with myriad dissatisfactions but often withhold their grievances due to a lack of accessible channels for lodging complaints. Even when channels exist, the protracted response times or, in some cases, the absence of any response exacerbates the problems, transforming simple dissatisfactions into significant hurdles. As students progress academically, complexities surrounding their education intensify, ranging from course registrations to information retrieval.

To gain deeper insights into students' grievances, a qualitative survey was conducted through oral interviews with 120 students across various faculties. The findings revealed a spectrum of concerns: inadequate classrooms, malfunctioning computers during exams, missing scripts, ill-equipped laboratories, absence of public addressing systems, non-academic staff apathy, bribery allegations against lecturers, and harassment by security personnel. Despite the prevalence of these issues, many students refrain from lodging complaints, often due to a lack of awareness regarding appropriate channels or sheer exhaustion from demanding academic schedules.

The proposed web-based student complaint management system seeks to alleviate these challenges, offering a myriad of benefits. Not only does it provide a structured avenue for students to voice their concerns, but it also serves as a crucial mechanism for administrators to pinpoint areas for service enhancement, keep senior management informed, improve overall service quality, and enhance communication with complainants.

The design and implementation of this web-based system aim to establish an efficient, timely, and equitable complaint-

handling mechanism that is easily accessible to students at no cost. By defining policies and procedures for complaint resolution, the project advocates for the automation of the complaints process and appeals registration, ensuring a streamlined and transparent mechanism for addressing academic grievances. This initiative holds the promise of not only mitigating existing challenges but also fostering a conducive environment for academic excellence.

1.1 Background of the Study

In order to have an effective educational system, there are some issues in the academic environment that need to be properly addressed. An example is the issue of complaints management system in the university. This issue has created a lot of problems for academic growth in various aspects of the educational system in the past. In order to support this approach, this project identifies a range of options that can be used to manage and resolve academic complaints. This includes the need for an administrator to make every effort to resolve potential or actual academic complaints as informally as possible in the first instance.

Handling complaints involve listening, understanding, offering a solution, executing the solution, and then following up.

According to Collins English Dictionary, a complaint is a statement in which you express your dissatisfaction with a particular situation. Although a lot of systems that were manual in the past have gone digital, but the issue of complaint management still remains manual. Many students, especially fresher, have many issues, which they are dissatisfied with, but they keep these issues bottled down

because they do not have a means of laying their complaints, and even when they do, it takes forever for them to receive a reply, sometimes they never receive a reply at all. Most of the time, these issues end up becoming serious problems for them. As students advance in their academics, there tends to be more issues surrounding their academics, from course registrations to information gathering.

In order to understand better the kind of complaints students have, we carried out a simple survey through oral interviews. About one hundred and twenty students were interviewed from different faculties in the school. We interviewed ten students from the faculty of Health Sciences, twenty five students from the faculty of Biosciences, fifty students from the faculty of Physical Sciences, fifteen students from the faculty of Arts, and twenty students from the faculty of Environmental Sciences. According to the statistics deduced, thirty five students complained about inadequate classrooms for lectures, nineteen students complained about malfunctioning of computers during Computer Based Examinations, twenty students complained about missing scripts, twenty students complained about absence of well-equipped laboratories for practical, ten students complained about lack of public addressing systems in classrooms, two students complained about lazy non-academic staff members, six students complained about lecturers asking for and accepting bribes, and eight students complained about harassment by security personnel. Most of these students have tried to lay these complaints, but due to some reasons like not knowing the right channel to lay their complaints or tiredness from hectic lectures, they never do.

Table 1.1 and Figure 1.1 below shows the description of the statistics of response counts from faculties:

Table 1.1: Analysis of Complaints Survey Data

Category of complaints	Responses from faculties					Summary
	Health Sciences	Bio Sciences	Physical Sciences	Arts	Environmental Sciences	
Lack of infrastructure	4	7	25	12	17	65
Malfunctioning of computers	0	12	1	1	5	19
Missing scripts	6	1	12	0	1	20
Non-academic staff	0	0	2	0	0	2
Bribery	0	3	5	0	0	8
Harassment	0	2	0	2	4	8

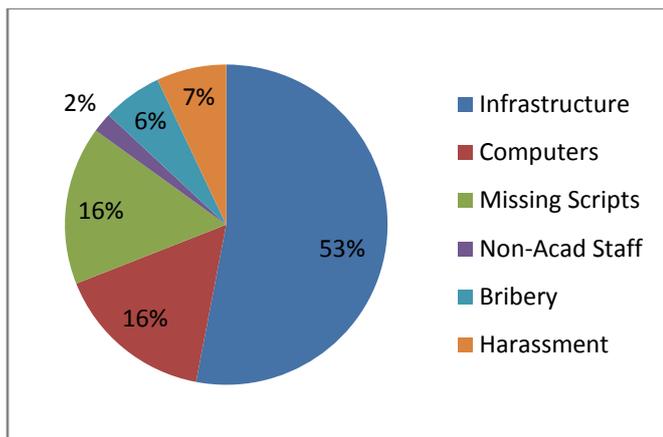


Figure 1.1: Pie chart of Complaints Survey Data

This system would help to reduce the difficulties that students experience in different areas of their school life. There are several benefits of laying complaints. They help the administrator to identify vital areas for service improvement, they help to keep senior management informed, they help to improve service, and above all, they help to improve complainant communication.

The design and implementation of web – based student complaint management system will help to maintain an effective, timely, and equitable complaint handling system which is easily accessible and offered to students at no charge. (Anusiuba, et.al, 2021).

This project defines the policy and steps for handling and resolving complaints and for this process to take place, there must be automation of the system that will handle the complaints process and appeal method of registration.

1.2 Statement of the Problem

In the contemporary landscape, heightened competition, stagnant or contracting markets, increased internalization, and product substitutions collectively underscore the escalating significance of well-implemented and adeptly managed complaint management systems (Welz, 2006). However, despite this imperative, certain complaint systems persist as laborious, inefficient, and excessively manpower-intensive, especially when juxtaposed with the potential efficacy of a computerized alternative.

Most university complaint systems currently operate in a manual mode, and even in cases where automation is in place, the response times to complaints remain unduly prolonged. The existing modus operandi involves students crafting formal letters detailing their grievances to the Head of Department, regardless of the nature of the complaint. The Head of Department then becomes the intermediary, forwarding the letters to the relevant complaint-handling entity. This

seemingly straightforward process becomes convoluted due to the multifunctional responsibilities of these entities, resulting in protracted delays in redirecting letters to the appropriate channels.

The researcher contends that the design and implementation of a web-based student complaint management system for tertiary institutions can significantly mitigate these challenges prevalent in the university environment.

The primary issues afflicting the complaint monitoring team in tertiary institutions can be delineated as follows:

- a) *Lack of Database:* The absence of a dedicated database for screening and managing complaints submitted on paper or verbally hampers the creation of accurate records of students and their grievances. Manual systems, therefore, prove ineffective and unreliable.
- b) *Absence of Adequate Security:* Inadequate security measures and maintenance of complaint records within the system create vulnerabilities for potential loss and manipulation of information. A minor issue could lead to the loss of all student complaint documents. Conversely, a computerized system ensures the preservation of records even in the face of minor challenges.
- c) *Low Performance:* The suboptimal performance of the manual system raises concerns about the potential misplacement or manipulation of complaints by staff or management members.
- d) *Lack of Precision:* The manual system's inherent limitations contribute to the absence of legitimate, precise, and concise data regarding students' implicit character, impeding an accurate understanding of their needs and concerns.

1.3 Objectives of the Study

The objectives of this study are the goals we hope to achieve when the new system is up and working. The objectives are:

- 1) To carry out a survey to understand better the kind of complaints students encounter in school and how complaints are approached by administrative personnel.
- 2) To implement a tertiary institution web-based student complaint management system that allows students to lay their complaints and receive rapid feedback in a much easier manner than the existing system with the use of HTML, JavaScript, PHP, and MySQL.

1.4 Scope of the Study

This study covers the procedure for managing complaints in tertiary institutions. The kinds of complaints that would be

managed with this system include Issue of missing script, Collection of bribes from lecturers and absence of proper infrastructure for effective learning.

These complaints have been chosen to be covered in the scope because, from the statistics discovered, more students complained about these issues and they appear to be more pressing than the other complaints mentioned.

2. Concept of Complaint Registration and Management

In this section, we aim to delineate the concept of complaint registration and management. A complaint is defined herein as an issue arising when an incident occurs, and there is an absence of willingness or initiative to address the matter at hand. Failure to articulate concerns when something goes awry not only deprives students of a platform for expression but also hinders the institution's potential for improvement.

According to the Collins English Dictionary, a register is an official or unofficial list or record of names and details. Computerized complaint registration, as described in this study, is the automated process through which complainants register dissatisfactions or grievances, leveraging computer systems and software. This mechanized approach empowers individuals to articulate complaints, receive prompt feedback, and pursue appeals if initial feedback proves unsatisfactory. With the prevalence of high-performance gadgets, students can effortlessly register complaints using just their mobile phones.

The sequential steps involved in registering a complaint encompass:

- 1) Consider registering a complaint.
- 2) Identify the issues contributing to dissatisfaction.
- 3) Prepare the complaint.
- 4) Write the complaint.
- 5) Register the complaint.
- 6) Follow up.

It is imperative to note that the registration of complaints precedes their management. When confronted with a complaint, obtaining detailed information and providing evidence, when available, are essential practices (Advocacy Research, 2021).

Kolsky's (2015) research indicates that only 13% of dissatisfied complainants directly express their grievances to administrative heads, and a mere 1 in 25 dissatisfied individuals voice complaints directly. These statistics underscore the tendency for dissatisfaction to either remain undisclosed or be shared with peers, potentially leading to

discouragement. Complaint registration not only facilitates the expression of criticism but also expedites the provision of timely feedback.

Surbhi (2018) defines management as the process of administering and controlling organizational affairs, creating an environment conducive to efficient and effective collaboration among organizational members. Correspondingly, complaint management involves the efficient handling and control of expressed dissatisfactions. Establishing a functional complaint management system is crucial for fostering a positive rapport with stakeholders. Strategic development is essential, determining where complaints should be received, how to respond to feedback, and to which departments or individuals criticisms should be forwarded (IONOS, 2019).

Salemme (2020) identifies ten steps to effective complaint management:

- 1) Listen and emphasize.
- 2) Become an advocate.
- 3) Learn more.
- 4) Reiterate the core issues.
- 5) Identify the cause.
- 6) Ask the complainant to suggest a solution.
- 7) Explain the next steps.
- 8) Make it happen.
- 9) Report back.
- 10) Offer something extra.

An effective Complaint Management System is integral to providing quality complainant service, measuring satisfaction, and obtaining valuable information for service improvement (Ombudsman, 2020).

The Small Business Development Corporation (2021) emphasizes that organizations providing goods and services to complainants must be aware of their obligations and rights under the Competition and Consumer Act 2010 (CCA).

Research suggests that the impact of a company's complaint handling design varies based on the characteristics of the complainants involved. An adaptive approach to complaint handling is recommended to prevent misallocation of attention, energy, and resources (Original Empirical Research, 2009).

While receiving criticism is never pleasant, effectively capturing, managing, and analyzing complainant complaints can yield valuable insights for organizations seeking to meet the current and future needs of complainants. Complainant loyalty is a compelling justification for robust complaints management (Freeman, 2019).

In contemporary business environments, characterized by competition, market dynamics, and globalization, well-implemented and managed complaint management becomes increasingly vital (Welz, 2006). Complaint Management Systems play a pivotal role in organizations prioritizing complainant satisfaction, fostering administrator-complainant relationships, and maintaining databases for improved connections between stakeholders.

2.1 Academic Complaints versus Non-Academic Complaints

In the University, there are two major types of complaints: Academic Complaints and Non-Academic Complaints.

1. Academic Complaint can be defined as an expression of dissatisfaction or unhappiness with the services provided by the University. As members of the educational community, students have the right to express their concerns regarding the assessment of their academic progress through the grading process. There are certain factors that may give rise to an academic complaint, these are:

- 1) Unfair treatment by a member of the academic staff.
- 2) Disagreement about ways of establishing/maintaining an effective working relationship between a student and staff member.
- 3) Disagreement about access to resources required by the student in order to meet the requirements of their course of study.
- 4) Allegations of inadequate teaching, assessment and evaluation.
- 5) The issues of missing scripts.
- 6) Allegations of lack of proper infrastructure for learning.

It is important that student academic complaints should be addressed and redressed at a level most accessible to the parties involved (The University of Auckland, 2020).

2. Non-Academic Complaint can be defined as expression of unhappiness towards non-academic issues. Situations sometimes arise in which students feel that they have not been dealt with fairly or do not agree with a policy decision made by an office of the University. Some factors that may give rise to Non-academic complaints are:

- 1) Issues of admission withdrawal.
- 2) Unavailability of necessary facilities.
- 3) Infringement of students' rights.
- 4) Alleged violation of University policies.
- 5) Alleged sexual harassment.

The purpose of Non-Academic Complaints policy is to hear students' grievances and complaints about the action and performance of University personnel in non-academic matters, to determine the validity of the complaint and recommend resolution (Austin Peay State University, 2017).

2.2 Complaint Management Process

Complaint Management process are the steps taken in order to effectively and efficiently manage complaints. The complaint management process needs to fulfil the following:

- 1) It should be complainant focused.
- 2) It should offer complete visibility and traceability.
- 3) It should be easily accessible.
- 4) It should be responsive.
- 5) It should be objective and fair.
- 6) It should maintain confidentiality.
- 7) It should drive appropriate solutions.
- 8) It should be properly reviewed.
- 9) It should be accountable.
- 10) It should drive continuous improvements.

Only when you handle the students' complaints effectively, you will be able to build stronger relationship with your students (Qualityze Inc., 2021). In order to effectively fulfil the above mentioned, a complaint management process should have the following components:

- i. *Policies and Procedures:* Clearly written policies and procedures should be given when handling complaints to ensure a consistent, compliant, and non-discriminatory avenue for conflict resolution.
- ii. *Clear channels of communication:* Easily accessible channels to submit complaints are needed. It is helpful to set up dedicated email addresses, website forms, or telephone extensions to receive feedback and resolve issues.
- iii. *Investigation Process:* It is critical to have a clearly defined system for addressing a complaint that any student lodges through the channel.
- iv. *Corrective Action:* If any complaints indicate that unfair or improper practices have taken place, the institution must take decisive corrective action to change the behaviour.
- v. *Retaining and Analysing Data:* The institution should have and follow a system for properly lodging students' complaints. Once it has been compiled, this data is a great source of insight that will allow you to recognize trends, identify areas of risk, and diagnose weaknesses in your students' experience with your institution.

2.3 Benefits of Student Complaint Management System

All complaints are to be thoroughly investigated with the aim of achieving an acceptable resolution, and informing improvements in service delivery and best practices (Qualityze Inc., 2021). Some benefits of the student complaint management system are:

- i. *Accountability*: When a complaint is passed for resolution, it is important to know that it has been handled properly. With complaint management system, you can assign an incident to any team member or an entire group of people. All complaints would be time and date stamped, so as to keep track of when the students made their complaints.
- ii. *Re-access student's information needs*: Effective complaint management system helps to thoroughly access the needs of students who are not able to speak up.
- iii. *Increase students confidence in decision making*: With access to an effective complaint management system and rapid feedback, students get to make better decisions on what to do next.
- iv. *Keeps track of complaints*: With the right complaint management solution in place, student's complaints can be monitored from the time it's submitted through the time it is completely resolved, including any follow-ups.
- v. *Rapid Feedback*: The complaint management system has a messaging system that uses in-built task notifications to send emails to students when their complaints have been fully resolved.
- vi. *Improves Documentation*: Having a concrete documentation process is critical. A unified complaint management system does so much more than help handle complaints from students. It also gives them a thorough documentation trail.
- vii. *Protection of reputation*: Every student has a voice, and they'll quite happily use it to pass on both praise and complaints. If there is no feedback complaint management system that works, there is no channel that students can use to speak up about issues they are facing. You're essentially goading them into complaining to the public, and this could have a negative impact on the University's reputation.
- viii. *Service upgrade*: Student complaint serve as a source of insight on what areas should be worked on and upgraded. Additionally, by studying bad reviews, the management can find new good ideas for improving services to students.
- ix. *Boost in communication*: Feedback also serves as a channel for communication between students and administrator. For students, it is important to know that their opinions are taken into account. Furthermore, when

students know that there is an open line of communication and their input matters, they are more likely to spread good words about the institution.

- x. *Security and Confidentiality*: Who has access to view the complaints can be a large concern. If confidential information is being dealt with, the system makes sure that only those people who absolutely need to see the incidents can do so. Using complaint management software, access can be restricted when necessary.

2.4 Review of Related Works

Organizations that engage with customers, in this context, students, inevitably encounter complaints as a routine aspect of their operations. Stone (2019) underscores that poor service organizations pose considerable challenges in conducting business. The literature reveals notable contributions in the realm of complaint management systems:

- Afify et al (2011) engineered a Service-Oriented framework for an e-complaint web-based system targeting the charity life cycle. The system's focus lies in minimizing customer dissatisfaction and encouraging active participation in service quality control.
- Oden (2021) devised a complaint system tailored for IT firms, Government Secretariats, Law firms, SMEs, Health establishments, Media firms, and Financial institutions. This system not only defines policies and steps for handling complaints but also allows customers to appeal unfavorable situations.
- Filip (2013) accentuates the significance of abstract complaints as indicators of organizational performance, emphasizing the cost-effective diagnosis of a company's weaknesses. The study delves into customer complaining behavior and its implications for service recovery strategy development and implementation.
- Aziz (2015) conducted a case study, exploring complaint management processes within a public governmental organization. The research examined the impact of these processes on public service provision and their potential in governmental services development and enhancement.
- Alve (2017) contributed a web application for complaint tracking and resolution, specifically designed for hostel and college settings. This system aims to streamline the coordination, monitoring, tracking, and resolution of complaints, offering organizations an effective tool for record-keeping and service improvement.
- Researchomatic (2013) investigated factors influencing students' intention to complain, employing a customer service framework. The study discerned patterns of complaint dissemination, whether through personal interactions or via web channels, depending on students' perceptions of the institution's responsiveness.

- Mirzoev (2018) delved into patient complaints, affirming their potential to inform improvements in service quality and contribute to overall health systems performance. The research emphasized the need for comprehensive, integrated interventions in patient complaints systems.
- Esraa & Mona (2018) explored the correlation between customer complaint behaviors and their expressed dissatisfaction with goods or services. The research proposed a generic approach for an effective customer complaint management system, emphasizing customer participation in quality control.
- Heumann (2012) investigated the repair of damaged customer relationships, emphasizing the attitudinal level of repair and the influence of various boundary conditions on recovery effectiveness.

2.5 Summary of Literature Review and Knowledge Gap

The surge in student dissatisfaction has prompted various mechanisms for handling complaints. This study uniquely concentrates on the computerization of complaints lodging and retrieval. It not only elucidates the concept and benefits of a student complaint management system but also synthesizes insights from related works in the field of complaint management systems. Furthermore, the study delves into the nuanced distinctions between academic and non-academic complaints, contributing to a comprehensive understanding of the landscape.

3. Analysis of the Existing System

The present system records and manages complaints manually. The steps taken in managing different complaints in the present system differ. This research focuses on managing complaints mentioned in the scope. In the case of complaints on missing scripts, the present system follows a series of steps.

- 1) The complainant (student) writes a formal letter to the Head of Department, stating in details the issues being faced.
- 2) The Head of Department forwards the letter to the department in charge of results.
- 3) The department in charge of results forwards the letter to the ICT officer in charge of uploading results.
- 4) The ICT officer in charge then checks to know why the result was missing, and tries to correct it.

In the case of issues of collection of bribes from lecturers, a formal letter is written to the Head of Department. And in the case of lack of proper infrastructure for learning, a letter is written to the Head of Department, and he directs the complaints to the Vice Chancellor. The present system is not only stressful and time consuming. It also leads to delay in

passing of complaints, especially complaints that needs to be attended to urgently.

This research work tries to bridge the gap by implementing a tertiary institution web-based student complaint management system that allows students to lay their complaints and receive rapid feedback in a much easier manner than the existing system. It tries to satisfy student's needs and simplify the work of the system administrator and lecturers.

3.1 Analysis of the Proposed System

The present system is prone to some problems as a result of the method used in processing and managing student's complaints. The proposed system will improve efficiency by reducing the time consumed in handling students' complaints. The analysis of the proposed system is discussed under two functional modules in the system. These modules are:

- 1) A web-based application used by complainants (students) to lay complaints, view their complaints history, make changes to their profile, and monitor how their complaints are being managed.
- 2) A terminal used by the system administrator to manage and process complaints, manage users, add new categories of complaints, view user logins, and respond to students' complaints.

3.2 Methodology

Waterfall Methodology was adopted in this project. The Waterfall Methodology is also known as a Linear-Sequential Life Cycle Model. It is a type of methodology in which, each phase must be completed before the next phase can begin and there is no overlapping in the phases. The Waterfall Model illustrates the software development process in a linear sequential flow. This means that any phase in the development process begins only if the previous phase is complete. The process of software development in the Waterfall Model is divided into separate phases. The outcome of one phase acts as the input for the next phase sequentially. Waterfall Methodology was adopted in this project because structured approach allows everyone to understand what needs to be done and when to do it and the project scope stays relatively static. All these phases are cascaded to each other, therefore each phase can only continue when each of the previous phases are completed.

3.3 Methods of Data Collection

This refers to the methods used to gather data for the analysis of this project. The various methods that were used are:

- 1) Oral Interviews: We carried out oral interviews. We made sure the respondents understood the questions, and we made sure they felt comfortable and open enough to discuss their problem and they made possible suggestions on how it can be solved. This method made us have first-hand knowledge about the kind of difficulties students encounter and how this project, once implemented, would be of great assistance to them.
- 2) The Internet: Some data from this project was also sourced from the internet. We visited the internet for researches on various complaint management processes.
- 3) Articles and Journals: A lot of data from this project was also sourced from online articles and journals. We visited already published articles and journals, and made proper citations.

3.4 Analysis of the Existing System

The analysis of the present system in this chapter is with the aim of identifying and correcting the weakness and shortcomings within the existing system. The following steps were taken during this analysis:

- i. Detailed study of activities in the existing system.
- ii. Procedures of operations.
- iii. Flow of information.
- iv. Recording the findings for the purpose of developing the most suitable arrangement for transfer from manual to computer operations.

The present system records and manages complaints manually. The steps taken in managing different complaints in the present system differ. This project focuses on managing complaints mentioned in the scope. In the case of complaints on missing scripts, the present system follows a series of steps.

- 1) The complainant (student) writes a formal letter to the Head of Department, stating in details the issues being faced.
- 2) The Head of Department forwards the letter to the department in charge of results.
- 3) The department in charge of results forwards the letter to the ICT officer in charge of uploading results.
- 4) The ICT officer in charge then checks to know why the result was missing, and tries to correct it.

In the case of issues of collection of bribes from lecturers, a formal letter is written to the Head of Department. And in the case of lack of proper infrastructure for learning, a letter is written to the Head of Department, and he directs the complaints to the Vice Chancellor.

The present system is not only stressful and wastes a lot of time but also leads to delay in passing of complaints, especially complaints that need to be attended to urgently.

This project tries to bridge the gap by automating the school's complaint management system. It tries to satisfy student's needs and simplify the work of the system administrator and lecturers.

3.5 Weakness of the Existing System

The existing system faces some problems in managing complaints which include:

- 1) Important document about a student's complaint may get lost.
- 2) It is time consuming and extremely stressful.
- 3) There is delay in processing and managing record of student's complaints.
- 4) Lack of computerized database.

4. Objectives of the Design

The objectives of the study are the goals we tend to achieve when the new system is up and working. The objectives of this study are:

- i. To design and implement a complaint management system that makes laying of complaints easier.
- ii. To create a system that is capable of managing complaints.
- iii. To create a system that aids the administrator in monitoring complaints by making a list of pending, not processed, and closed complaints.

4.1 High Level Model of the Proposed System

High level model is used to convey the core concepts and principle of an organisation in a simple way using concise descriptions. The advantage of developing a high level model is that it supports understanding, analysis, communication, and decision making of the system.

The complaint management system has two main modules. The diagram below describes the modules.

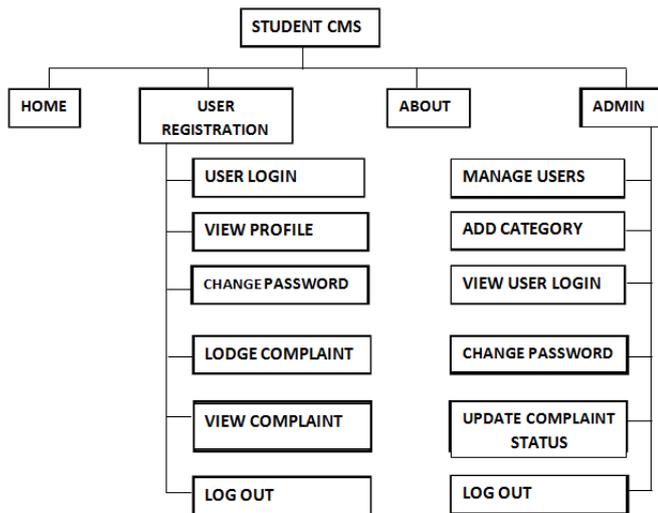


Figure 1: High Level Model of the Proposed System

4.2 Control Centre / Main Menu (Home Page Design)

From the main menu display, the user can perform some functions. These functions include the following:

- 1) **User Login:** This module is used to log in users who have already been registered in the database. It also allows users to make changes to password in the case of forgotten password.
- 2) **User Registration:** This module is used to register students who do not yet have accounts.
- 3) **Access Admin Panel:** This module allows a user to log in to the admin panel. In this case, only the admin has access to this module.
- 4) **View Software Description:** This module allows users to visit the “about us” page, and view the software description and objectives.
- 5) **Subscribe for Notifications:** This module enables users to subscribe to newsletter in order to receive notifications whenever complaints have been attended to.

In summary, users (students) use the main menu to create an account and log in to their profiles. While, it allows the admin to log on to the admin panel and effectively manage complaints.

4.3 Database Development Tool

The database development tools used in the development of this project are MySQL and phpMyAdmin.

- 1) **MySQL:** MySQL is a database development tool that helps in creating a database that is used in storage and manipulation of data, clearly defining the relationship of data tables. Clients can make requests by typing specific SQL statements on MySQL, then the server will respond with the requested information and it will appear on the clients’ side. It must be noted that SQL and MySQL are not the same. MySQL is a Relational Database Management Tool that implements a client-server model. Clients and servers communicate with the use of SQL, which is a domain – specific language. SQL stands for Structured Query Language.
- 2) **phpMyAdmin:** phpMyAdmin is a database management tool that is written in PHP. It was developed to handle the administration of MySQL over the web. PhpMyAdmin supports a wide range of operations on MySQL. Operations involving managing databases, tables, columns, relations, indexes, users, and permissions can be done via the user interface, while any SQL statement can still be directly executed.

4.4 Database Design and Structure

The database was designed using MySQL because it has the ability to hold and handle large numbers of records and tables. The tables below give the entire database used in this project.

Table 1: Complaints Record

	Field Name	Data Type	Size	Description
1.	Complaint Number	Integer	11	Complaint number
2.	User Id	Integer	11	User id
3.	Category	String	255	Complaint category
4.	Subcategory	String	255	Complaint subcategory
5.	Complaint Type	String	255	Type of complaint
6.	Noc	String	255	Nature of complaint
7.	Complaint Details	String	100	Details of complaint
8.	Complaint File	String	255	File related to complaint
9.	Reg Date	Date and Time		Time stamp
10.	Status	String	50	Status of complaint
11.	Last Updation Date	Date and Time		Time stamp

Table 4.2 Admin account record

	Field Name	Data Type	Size	Description
1.	Id	Integer	11	User id
2.	Username	String	250	Username of admin
3.	Password	String	250	Admin password
4.	UpdationDate	Date and Time		Time stamp

Table 4.3 Complaints category record

	Field Name	Data Type	Size	Description
1.	Id	Integer	11	Category id
2.	Category Name	String	255	Name of category
3.	Category Description	String	255	Description of category
4.	Creation Date	Time stamp		Date of category creation

Table 4.4 Complaints subcategory record

	Field Name	Data Type	Size	Description
1.	Id	Integer	11	Subcategory id
2.	Subcategory	String	255	Subcategory
3.	Creation Date	Timestamp		Date of creation

Table 4.5 Complaints remark record

	Field Name	Data Type	Size	Description
1.	Id	Integer	11	Remark id
2.	ComplaintNumber	Integer	11	Complaint token
3.	Status	String	255	Complaint status (Pending, In process, Closed)
4.	Remark	String	255	Remark to users
5.	RemarkDate	Timestamp		Date of remark

Table 4.6 User login record

	Field Name	Data Type	Size	Description
1.	Id	Integer	11	Login id
2.	Reg no	String	255	Student registration number
3.	User ip	String	16	Binary
4.	Login Time	Timestamp		Time of login
5.	Log Out	Timestamp		Time of logout
6.	Status	Integer	11	Login status

Table 4.7 User registration record

	Field Name	Data Type	Size	Description
1.	Id	Integer	11	User id
2.	Full Name	String	255	Student's full name
3.	User Reg	String	255	Student's registration number
4.	Password	String	255	Student's password
5.	Contact No	Integer	11	Student's phone number
6.	Department	String	100	Student's department
7.	Faculty	String	100	Student's faculty
8.	User Image	String		Student's image
9.	Reg Date	Timestamp		Registration date
10.	Status	Integer	1	User status

4.5 Admin Terminal

The admin panel is a web based application that is used to monitor student's complaints made at the user's terminal. Below is the program flow of the admin panel.

Note: It is assumed that the web browser has been launched and the URL (Universal Resource Locator) has been typed at the required location.

The system was designed in menu format, as follows:

- 1) Enter the username and password to check for authorization.
- 2) If username and password are correct, the admin panel homepage is displayed, else the system requests for the correct username and password.

From the homepage, the admin can perform many functions. The admin panel has six modules. These modules are:

- 1) **Change Password:** From this module, the admin can make adjustment to already existing password. A possible reason for changing passwords are difficulty in remembering already existing password.
- 2) **Manage Complaints:** This module shows pending complaints, closed complaints, and complaints that are yet to be processed. The module helps the admin to effectively keep track of complaints laid.
- 3) **Manage Users:** This module allows the admin to effectively keep track of users who have been registered.
- 4) **Add Category:** This module enables the admin to add a new category of complaint to the already existing list of complaints. This module was added in case the school decides to manage new sets of complaints.
- 5) **User Login:** Through this module, the admin can monitor successful and failed registrations to the user page. If a user successfully logs in, the status update reads "successful", else it reads "failed".
- 6) **Logout:** This module allows the admin to leave the panel and terminate session completely.

The admin panel is mainly for managerial purposes. It is used strictly by the administrator to monitor and manage complaints.

4.6 User Terminal

The user terminal is a part of the program module that students can use to lay complaints and receive feedback. The system was designed in the following format:

- i. Enter registration number and password and check for authentication.
- ii. If the registration number and password are correct, the user dashboard is displayed, else the system requests for the correct registration number and password.

From the menu displayed after a user logs in, many functions can be performed. These functions are:

- 1) **Dashboard:** This is the default menu that is displayed after user login has been authenticated. From this module, the user can view the status of complaints that have been laid. The number of not processed complaints, in process complaints, and closed complaints are each displayed.
- 2) **Account Setting:** This module is divided into two sub-modules, which are profile and change password. The profile module allows users to view and make necessary corrections to their respective profiles. It also allows a user to add a display image, but this is not compulsory. The change password module allows users to make changes to their passwords, either because it is not strong enough or because they feel they might not remember it later.
- 3) **Lodge Complaint:** This module is used to lay complaints. It allows users to give a detailed explanation of their complaints after selecting a category and subcategory. It also allows users to add a possible image relating to the complaint, in order to make the administrator understand the complaint better.
- 4) **Complaint History:** From this module, users can monitor their own complaints. Users can view their complaint number, complaint registration date, and complaint status.
- 5) **Logout:** This module is used to exit the system and terminate session.

4.7 System Flowchart

System flowcharts are a way of displaying how data flows in a system and how decisions are made to control events. Symbols are used to make illustrations.

5. Summary

The significance of students articulating their grievances through proper channels cannot be understated, as it directly impacts the reputation of the school. A proficient complaint system not only provides the institution with heightened operational control and efficiency but also facilitates the proper expression of concerns. Conversely, an ill-suited system can lead to financial wastage and persistent frustration. Transitioning from a manual to a computerized complaint system presents challenges and pitfalls, but the ensuing benefits far outweigh the initial difficulties, making it a worthwhile investment of time and effort. Consequently, the imperative for a computerized complaint management system in academic institutions cannot be overemphasized.

5.1 Conclusion

Automated robust Tertiary Institution complaint management software, as envisaged in this project, perpetually captures the sentiments of students toward the educational system. This software facilitates instantaneous lodging of complaints, allows students to monitor the status of their grievances, and ensures prompt feedback from administrators. The meticulous storage of detailed complaints in a database enhances accessibility for retrieval at any juncture. The use of complaint software often reveals nuances in student expectations that may not be apparent to administrators, thus proving invaluable.

5.2 Recommendation

To effectively implement the proposed design, the following recommendations are put forth:

- 1) Adherence to Hardware and Software Specifications: Ensure that the stipulated hardware and software requirements are strictly adhered to for optimal system performance.
- 2) Administrator Training: Provide comprehensive training to administrators to adeptly manage complaints using the complaint management software.

5.3 Application Areas

This system is particularly recommended for universities requiring substantial upgrades, as it promises to enhance decision-making processes through effective complaint management. Its application extends to institutions seeking to fortify their operational efficiency and responsiveness to student concerns.

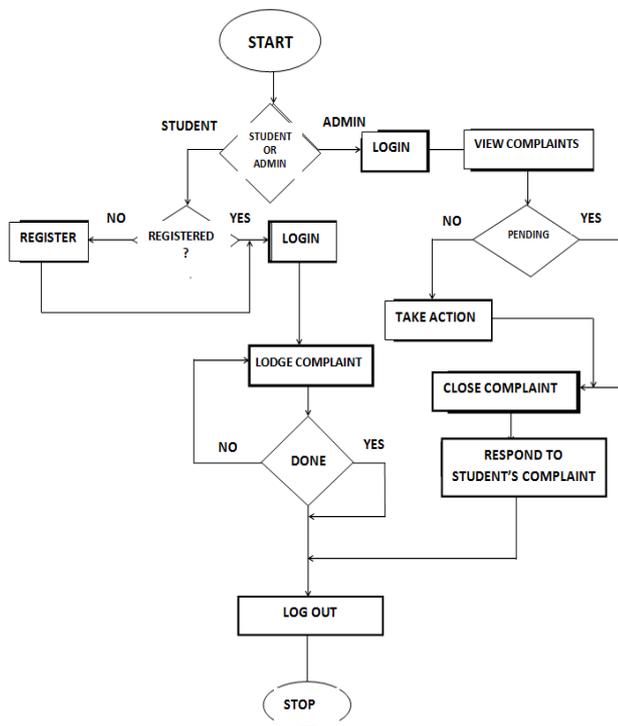


Figure 2: System Flowchart of the Proposed System

4.8 Hardware and Software Requirements

For effective use of the new system, the minimum requirements for the hardware components are Pentium4 board with 1GHZ speed, 1GB RAM size. A Hard Disk of 40GB and Display Unit of at least 14" Monitor (VGA) while the minimum operating system that must be used is Windows XP. Other software required includes Text editor like Visual Studio code, Notepad++, Sublime text, etc., A web browser and A database development tool like XAMPP.

4.9 Program Development

Program development of this system was done using the PHP and JavaScript programming languages while MySQL is use for the database. The choice of the programming languages was based on the fact that versatile and efficient programming languages are needed for the design of a high performance database system application such as the project at hand. However, these languages were chosen for the development of this project, not only because they are the only languages the developers are familiar with, but because they offer the following programming merits:

- i. They make the art of programming very approachable.
- ii. They are procedural languages that are very easy to learn and understand.
- iii. The help to make the development of applications faster.
- iv. The help to make the development of applications faster.

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4. APPENDIX: SAMPLE OUTPUT

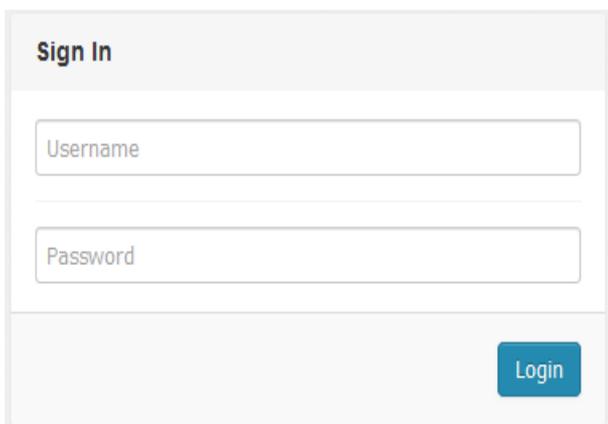


Figure 3: LOGIN PAGE: The admin login form requests for username and password to grant a user authentication to access the main menu

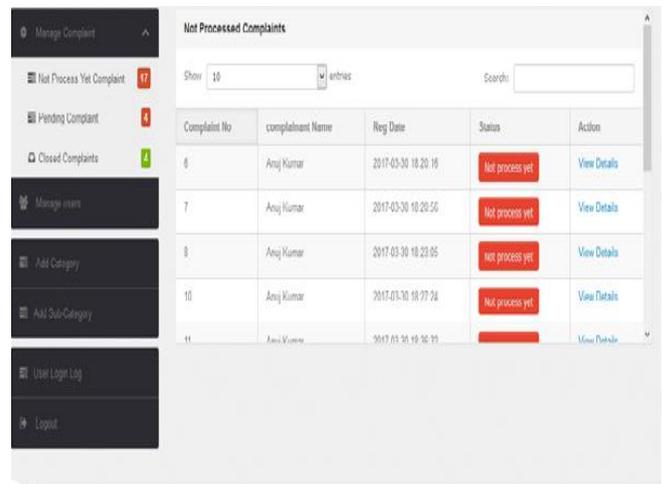


Figure 4: NOT PROCESSED COMPLAINTS PAGE: This menu gives the admin the list of complaints that have not been processed

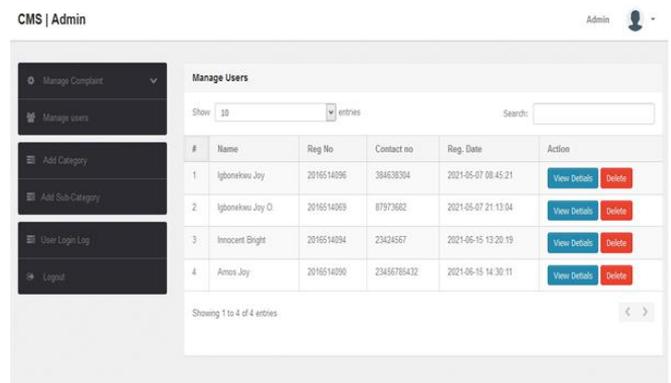


Figure 5: MANAGE USERS: This menu allows the admin to keep track of and delete the registered complaints

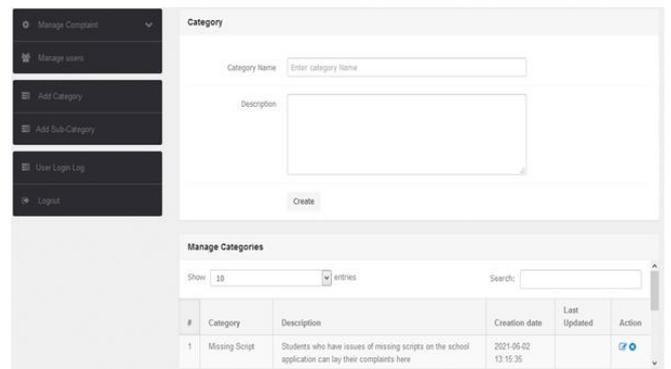


Figure 6: ADD CATEGORY: From this menu, the admin can add new category of complaints

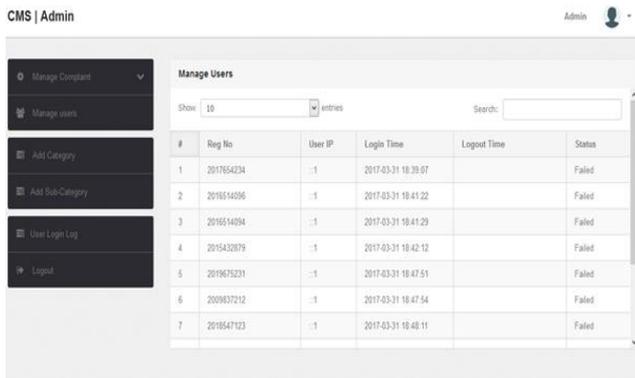


Figure 7: USER LOGIN LOG: This menu allows the admin to keep track of users who tried to login to the program

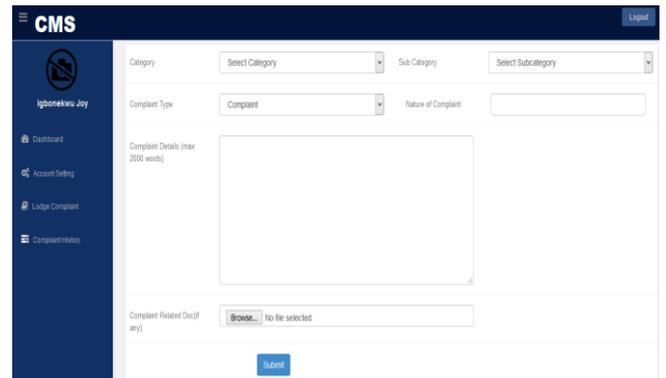


Figure 10: LODGE COMPLAINT: This allows the user to stat complaints in details

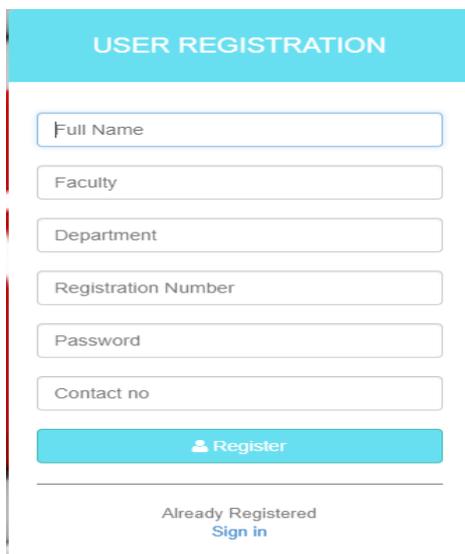


Figure 8: REGISTRATION PAGE: The registration page allows users to register their details into the database

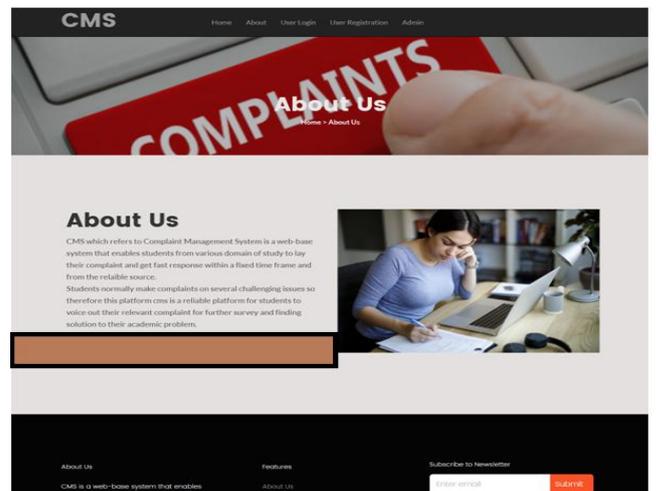


Figure 11: HOME PAGE

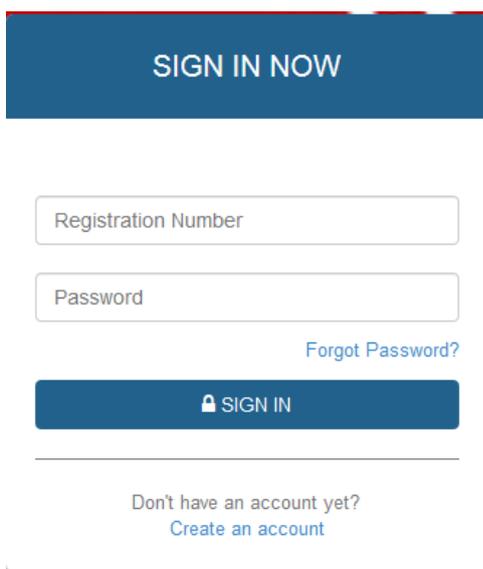


Figure 9: LOGIN PAGE: The login page asks for the user's registration number and password for authentication

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